

DIRECTION

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Global offshore to be a big part of WindEnergy Hamburg

The offshore sector of the wind industry has made headlines in recent months. It has progressed rapidly, both in technical innovation and in the competitiveness of offshore energy in the electricity market. Many of the companies active in the offshore wind market are presenting their portfolios at WindEnergy Hamburg, the world's leading expo for onshore and offshore wind energy, September 25-28. The expo will be held in parallel with the global conference of WindEurope at the Hamburg Messe site — together they comprise the Global Wind Summit, the biggest and most important meeting of the wind industry worldwide. WindEnergy Hamburg is expecting about 1,400 exhibitors from all parts of the world, with about 40 percent of them showcasing products or services for offshore wind farms. The range covers the whole of the value chain, from turbines, towers, and foundations to gearboxes, generators, bearings, shafts, and lubes, as well as O&M solutions and installation vessels.

GLOBAL WORLD MARKET GROWTH

Besides main offshore wind market Europe, other geographical regions of the world might start experiencing quick growth too in the next years, says GWEC in its 2017 Global Wind Report. The organization points at emerging markets with huge interest in the technology and substantial growth potential including Taiwan, South Korea, the U.S. (East Coast), Japan, India, Brazil, and Australia.



There are now 18,814 MW of installed offshore capacity around the world. (Courtesy: WindEnergy Hamburg)

China is already the largest offshore market outside Europe, with, according Wikipedia 'Liste der Offshore-Windparks' statistics, close to 2 GW of operation at the end of 2017. Among Chinese offshore wind exhibitors in Hamburg are turbine OEM's Envision Energy and Ming Yang.

Offshore, according to GWEC, represented about 8 percent of the global market last year, and it represents 3.5 percent of the cumulative installed capacity, but it's growing fast. Global offshore installations in 2017 were 4,334 MW, of which about 27 percent was installed in markets outside Europe. Overall, there are now 18,814 MW of installed offshore capacity around the world.

According to WindEurope's report "Offshore Wind in Europe; Key trends and statistics 2017," Europe's net installed capacity, spread over 560 new turbines across 17 windfarms, increased last year by 3,148 MW. The aver-

age offshore turbine capacity more than doubled to 5.9 MW over the past decade, and 23 percent higher set against 2016. Project size for offshore windfarms under construction during 2017 grew to 493 MW from a 79.6 MW average in 2007. The current windfarm size record holder is the 1.2 GW Hornsea One project (U.K.) with construction starting this year. A 2017 floating wind milestone was the commissioning of the world's first windfarm, Scotland's 30 MW Hywind II consisting of five 6 MW Siemens Gamesa direct drive turbines.

Internationally, new innovative technology and fresh solutions for "traditional" fixed-bottom and floating wind generated huge interest. A number of Belgian exhibitors, all active in offshore wind, jointly represented themselves in Hamburg as the BOC VZW Belgian Offshore Cluster in a national pavilion. BOC is an association of offshore wind industry co-suppli-

ers with about 60 members.

“At the Belgian pavilion at WindEnergy Hamburg, our partners will highlight their specific know-how and experiences to international wind-industry visitors,” said BOC Chairman Christophe Dehaene.

A main overall theme for all international contenders is how to successfully enter new and emerging markets. The Global Wind Summit in Hamburg offers an excellent platform opportunity. A second main theme is achieving optimized cost-effectiveness through the deployment of next-generation large-scale turbines.

Siemens Gamesa and MHI Vestas dominate Europe’s largest offshore wind market with direct drive and medium-speed geared turbine solutions respectively, in ratings up to 9.5 MW. They and other exhibitors such as GE Renewable Energy and Senvion all explore next-generation 10 to 15-plus MW future platforms. German engineering consultancy aerodyn-engineering develops a fully integrated 15 MW floating system incorporating twin 7.5 MW two-bladed counter-rotating downwind turbines with 150-meter rotor diameters.

107-METER ROTOR BLADES

GE’s 12 MW Haliade X direct drive turbine in development features a record 220-meter rotor composed of 107-meter blades developed by LM Wind Power of Denmark. The turbine, with first deliveries planned in 2021, features only 316 W/m² specific power rating, a configuration showing future direction for other large-scale turbine developments. Such supersize rotor offers higher yields, especially during periods

with little wind. When this coincides with high wind power penetration levels under liberalized market conditions in specific offshore wind markets, it could contribute to better electricity prices. A related positive impact is enhanced grid stability. All these aspects form an integral part of many

different smart energy solutions, including intermediate storage technologies being developed by Hamburg WindEnergy exhibitors from across the world. They also will explain to international visitors the latest technology advancements regarding industrialization, with increased use of “big data.”

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This offers offshore wind farms combined benefits like higher operating reliability through better longer-term failure prediction and smarter cost-reducing O&M solutions. This long-time turbine tracking could result in more advanced windfarm upkeep strategies primarily aimed at further driving down offshore LCOE.

SUBSTRUCTURES

Monopiles were the most popular structure solution of all new installed foundations in 2017 with 87 percent, with jackets taking second position with 9.4 percent, according to WindEurope. WindEnergy Hamburg exhibitors EEW Group and SIF Netherlands led Europe's total offshore substructure market with shares of 53 percent and 24.1 percent respectively.

“EEW SPC manufactures monopiles currently up to 10-meter diameter. Our daughter company EEW OSB produces TPs in the U.K., and EEW Group also manufactures pre-fabricated components for jackets. This range of products made by EEW offers flexibility to our existing clients and will enable a necessary leap forward in emerging main offshore markets like the U.S. and Asia,” said Michael Hof, COO/managing director of EEW SPC.

The largest monopiles available weigh about 1,500 around metric tons, which puts additional pressure to continuously upgrade vessels, foundation handling, and hoisting gear capacities and performance. Multiple wind-farm installation specialists will show their combined in-house capabilities to Hamburg WindEnergy visitors. Exhibitor Van Oord Offshore recently took delivery of a new 1,600-metric-ton main crane re-fitted at its self-propelled Aeolus jack-up, initially commissioned in 2014 with a 900-metric-ton crane. Damen Shipyards will inform visitors about its novel ‘walk-to-work’ Service Operations Vessel (SOV) for offshore windfarm upkeep.

developers will highlight their dedicated floating concepts to WindEnergy Hamburg visitors, like aerodyn-engineering and GustoMSC (semi-submersible) and GICON (tension-leg, TLP), while spar-type solutions are characterized by their operational stability.

“WindEnergy Hamburg 2018 is, for us, an important international platform,” said GICON Founder Prof. Jochen Grossmann. “Last year, GICON teamed up with U.S.-based Glostén, developer of the Pelastar TLP. We in-house developed GICON-SOF TLP technology during the past decade. Individual strengths of both commercially ready products will be combined into a new hybrid solution for the global floating wind market, and we will show international visitors all features and benefits.”

Floating offshore wind in general enjoys growing wind-industry interest, reflected by the increasing number of projects and the larger turbines sizes selected for these platforms. ↘

Source: WindEnergy Hamburg

For more information, go to www.windenergyhamburg.com/en/

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LOC Renewables expands geotechnical team

LOC Renewables, through its specialist naval architectural and design firm, Longitude Engineering, has announced the expansion of its geoscience consultancy team, strengthening its end-to-end project development capabilities.

The team will deliver a range of services related to the mitigation of ground risk for offshore wind development, from concept to construction and maintenance.

The continued expansion of offshore wind worldwide means

developers face new geotechnical and geological design challenges on each project.

With wind farms being built in so many different locations and in combination with a range of different technologies, engineering solutions need to be developed for varied and often difficult ground conditions.

From ground risk management for turbine foundations and cables, through to penetration analyses for vessel movements, the fac-

tors that developers must consider can vary greatly.

In addition to carrying out initial desk and feasibility studies, the geotechnical team will conduct detailed site visits and assess geological and metocean conditions to identify the best siting for wind farms and cabling corridors.

DESIGN AND ANALYSIS

Their provision of marine surveys will span geotechnical design and analysis that supports structural engineers to deliver a successful project.

Sound geotechnical and geological engineering is the bedrock on which wind-farm structures can be installed and is an essential component for managing construction and operation risks.

“While there are many aspects to consider when it comes to wind-farm development, the assessment

of ground risk is crucial to a project’s success in the construction phase and over its lifetime,” said Cara Watson, newly-appointed lead engineering geologist at Longitude Engineering. “Extensive experience in offshore energy allows us to offer a range of services including geohazard analysis, project planning, survey management, and full ground model development.”

GROUND CONDITIONS

“Foregoing the adequate consideration of ground risk introduces uncertainties and increases risks that project developers will usually end up paying for later,” said Cath Bradley, lead geotechnical engineer at Longitude Engineering. “For example, without a detailed knowledge of the ground conditions, designers are forced to be more conservative

and adopt larger and more expensive foundations for their turbines. “Obtaining the geotechnical and geological ground conditions for a site allows for optimized foundational designs. This, in turn, lowers the risk of damage to equipment, as well as the risk of delays or cost overruns arising from changes to layout, designs or cable routes.”

With a focus on marine survey planning and management, cable routing and burial, and geotechnical analysis including anchor penetration and scour protection studies, leg penetration analysis and foundation design, the team is currently employed on a number of projects across Europe and Asia. ↘

Source: LOC Renewables

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A large advertisement for Abaris Training. The background is a photograph of a wind turbine in a field. The text 'THINGS AREN'T ALWAYS THIS PRETTY' is in large white letters at the top. Below it, 'WINDBLADE REPAIR TRAINING' is in yellow and green. Underneath, 'Classes fill up fast - ENROLL TODAY!' is in blue. At the bottom, 'ABARIS TRAINING' is in large blue letters with a stylized arrow graphic. Below that, the phone number '+1.800.638.8441' and website 'www.abaris.com' are listed. At the very bottom, it says 'Leading the World in Advanced Composite Training Since 1983!'.